

States (Loosanoff and Nomejko 1956; MacKenzie 1970; Hidu and Haskin 1971; Hidu 1978; Haven et al. 1981; Kennedy and Breisch 1981; Haven and Fritz 1985; Abbe 1986; Hargis and Haven 1988), relatively little is known of North Carolina waters (Chestnut and Fahy 1953; Munden 1975; 1981; Ortega 1981).

We undertook the present study to determine how the environment (location, depth, and salinity) affected oyster demography (recruitment and growth) in the coastal waters of North Carolina. Recruitment here is defined as larval settlement and survival of spat for up to three weeks. We were interested in identifying the conditions for highest production yield in order to evaluate the efficacy of the State's cultch planting program. Is cultch presently being planted in those areas with the highest potential yields? What is the best time for the planting of cultch? What other steps can be taken to enhance yield? Answers to these questions are necessary if North Carolina's oyster industry is to regain some of its previous strength.

MATERIALS AND METHODS

The study was carried out in Pamlico and Core Sounds, between Cape Hatteras and Cape Lookout, North Carolina (Fig. 2). Pamlico Sound is shallow, with a mean depth of 5 m, dominated by lunar tides in the east, and wind-generated flow in the west (Epperly and Ross 1986). Core Sound is similarly shallow and dominated by lunar tidal flow. The Neuse and Pamlico rivers discharge into western Pamlico Sound, creating a salinity gradient from west to east (Epperly and Ross 1986). In western Pamlico Sound annual variation in salinity is from 10-30 ‰, whereas salinity in eastern Pamlico Sound and in Core Sound remains higher, especially near oceanic inlets. These waters are shallow enough so that wind mixing generally precludes vertical stratification (Giese et al. 1979).

During March and April, 1988, we established 12 study sites in Pamlico and Core Sounds to determine the effects of location, salinity, and depth on oyster recruitment and growth. Most of these sites have been included in the NCDMF's cultch planting program since 1981 (M. Marshall, NCDMF personal communication). Indeed, we used the NCDMF marker buoys whenever possible to mark our study sites. Our sample unit consisted of 2.5cm mesh vexar (plastic) mesh cut into 40 X 40 cm square mats. Sixteen oyster shells (~9 cm in length) were drilled at each end and tied to each mat with plastic ties. Mats were deployed at a site in a horizontal orientation approximately 10 cm off the bottom; the corners were tied to steel concrete reinforcing bars (rebar) driven into the bottom.